

REMARKS

Applicant is in receipt of the Office Action mailed December 14, 2004. Claims 12, 17, 40, 53, 75, and 88 have been amended. Claims 1-88 remain pending in the case. Reconsideration of the present case is earnestly requested in light of the following remarks.

Objections

The Specification was objected to for omission of application and patent numbers. Applicant has amended the Specification accordingly. Removal of the objection to the Specification is respectfully requested.

Claim 17 was objected to due to a missing period. Applicant has amended claim 17 accordingly. Removal of the objection to claim 17 is respectfully requested.

Claims 12, 40, 53, 75, and 88 have been amended to replace an incorrect article (“an”) with a correct article (“a”).

Applicant has changed the title of the application to more clearly indicate the nature of the application.

Section 103

Claims 1-88 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 5,603,034 to Taylor et al. (hereinafter, “Taylor”). Applicant respectfully disagrees.

As the Examiner is certainly aware, to establish a *prima facie* obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 U.S.P.Q. 580 (C.C.P.A. 1974), MPEP 2143.03. Obviousness cannot be established by combining or modifying the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion or incentive to do so. *In re Bond*, 910 F. 2d 81, 834, 15 USPQ2d 1566, 1568 (Fed. Cir. 1990).

Moreover, as held by the U.S. Court of Appeals for the Federal Circuit in *Ecolochem Inc. v. Southern California Edison Co.*, an obviousness claim that lacks evidence of a suggestion or motivation for one of skill in the art to combine prior art references to produce the claimed invention is defective as hindsight analysis.

In addition, the showing of a suggestion, teaching, or motivation to combine prior teachings “must be clear and particular . . . Broad conclusory statements regarding the teaching of multiple references, standing alone, are not ‘evidence’.” *In re Dembicza*k, 175 F.3d 994, 50 USPQ2d 1614 (Fed. Cir. 1999). The art must fairly teach or suggest to one to make the specific combination as claimed. That one achieves an improved result by making such a combination is no more than hindsight without an initial suggestion to make the combination.

Claim 1 recites:

1. A system for debugging a program which is intended to execute on a reconfigurable device, the system comprising:
 - a reconfigurable device, comprising:
 - a programmable hardware element; and
 - one or more fixed hardware resources coupled to the programmable hardware element; and
 - a computer system comprising a processor and a memory;
 - wherein the computer system is coupled to the reconfigurable device;
 - wherein the memory stores the program specifying a function, wherein the program is convertible into a hardware configuration program which specifies a configuration for the programmable hardware element that implements the function, and wherein the hardware configuration program further specifies usage of the one or more fixed hardware resources by the programmable hardware element in performing the function;
 - wherein the programmable hardware element is further configurable with a test feed-through configuration, wherein, after configuration with the test feed-through configuration, the programmable hardware element provides for communication between the program and the one or more fixed hardware resources; and

wherein, for debugging purposes, the program is further executable by the processor of the computer system to test performance of the function including the usage of the one or more fixed hardware resources.

As stated in the Abstract, Taylor is directed to: “A configurable hardware system for implementing an algorithmic language program, including at least two programmable logic devices (PLD), a private hardware resource connectible to one PLD, and a programmable connection between PLDs, all of which may be configured as a module or distributed processing units (DPU)” as well as “a method of translating source code in an algorithmic language into a configuration file for implementation on one or more DPUs”.

Applicant respectfully submits that in asserting that it would have been obvious to modify Taylor to include a “test feed-through configuration”, the only motivation suggested by the Examiner is “because simulating connected hardware peripherals is important when debugging software that is to be convertible into a hardware configuration program”, where the Examiner cites Taylor col. 4, lines 25-29, which reads, “A reconfigurable equivalent part can be incorporated in a design, tested, and modified with no or minimal modifications to physical hardware, essentially eliminating manufacturing revision costs in designing special purpose computers”.

Applicant submits that in attempting to establish a *prima facie* case of obviousness, the Examiner has modified Taylor using Applicant’s claim 1 as a blueprint, simply citing an improved result for motivation, and thus the 103 rejection is improper.

Additionally, Applicant respectfully submits that the cited passage in no way suggests or indicates the desirability of a “test feed-through configuration”. For example, the passage cited is from Taylor’s Background section, and merely notes that reconfigurable logic devices may be used to simulate hardware devices, e.g., during the design of hardware systems. Moreover, the Examiner herself states “simulating connected hardware peripherals is important when debugging software that is to be convertible into a hardware configuration program”. Applicant submits that while this use of reconfigurable logic devices may be important and useful, claim 1 does not depend upon this feature for novelty, and further submits that the cited motivation/benefit

actually relates to the prior art (as described in Taylor's Background section). Applicant notes that nowhere does Taylor disclose or even mention a feed-through configuration.

Applicant further submits that Taylor actually teaches away from Applicant's invention as represented in claim 1. For example, Applicant notes that according to Taylor's system, the user develops a program, such as a C program, on a computer, as described in col. 21, line 65 – col. 22, line 5, which reads:

A programmer begins by preparing a program for a problem of interest. The program is typically prepared from C language instructions. The basic program functionality can be analyzed and debugged by traditional methods, for example using a Microsoft C compiler to run the program on an MS-DOS based platform. This same C code, possibly with some minor modifications, can be recompiled to run on a configurable architecture system.

Thus, according to Taylor, the basic functionality of the program is debugged using traditional methods. All other descriptions of debugging in Taylor indicate that any further debugging occurs after the program has been converted to one or more hardware configuration files and deployed to respective one or more reconfigurable hardware devices. In other words, in Taylor's system, once the program is developed and debugged via traditional methods, the program is converted and deployed to various hardware resources, e.g., PLDs, DSPs, etc., where further debugging can then be performed. Taylor neither teaches nor suggests debugging the program on the host computer system where the program communicates with fixed hardware resources through a programmable hardware element configured with a feed-through configuration. As noted above, the novelty of claim 1 does not depend upon the fact that PLDs can simulate hardware parts or devices (prior art).

In direct contrast to Taylor, in Applicant's system as represented in claim 1, a programmable hardware element may be configured with a feed-through configuration that facilitates communication between a program executing on a computer system (where the program is convertible into a hardware configuration program which specifies a configuration for the programmable hardware element that implements a function, and where the hardware configuration program further specifies usage of one or more fixed hardware resources by the programmable hardware element in performing the function)

and one or more *fixed hardware resources*, wherein, for debugging purposes, the program is further executable by the processor of the computer system to test performance of the function including the usage of the one or more fixed hardware resources.

Nowhere does Taylor teach or suggest, or even hint at, these features and limitations.

Thus, for at least the reasons provided above, Applicant submits that claim 1 and those claims dependent therefrom are patentably distinct and non-obvious over Taylor, and are thus allowable.

Claims 16, 23, 29, 46, 59, 69, 76, and 85 include similar features and limitations as claim 1, and so the above arguments apply with equal force to these claims. Thus, Applicant respectfully submits that claims 16, 23, 29, 46, 59, 69, 76, and 85, and those claims respectively dependent therefrom, are patentably distinct and non-obvious over Taylor, and are thus allowable.

Applicant also asserts that numerous ones of the dependent claims recite further distinctions over the cited art. However, since the independent claims have been shown to be patentably distinct, a further discussion of the dependent claims is not necessary at this time.

CONCLUSION

Applicant submits the application is in condition for allowance, and an early notice to that effect is requested.

If any extensions of time (under 37 C.F.R. § 1.136) are necessary to prevent the above referenced application(s) from becoming abandoned, Applicant(s) hereby petition for such extensions. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetz PC Deposit Account No. 50-1505/5150-63400/JCH.

Also enclosed herewith are the following items:

- Return Receipt Postcard
- Request for Approval of Drawing Changes
- Notice of Change of Address
- Check in the amount of \$ _____ for fees (_____).
- Other:

Respectfully submitted,



Jeffrey C. Hood
Reg. No. 35,198
ATTORNEY FOR APPLICANT(S)

Meyertons, Hood, Kivlin, Kowert & Goetz PC
P.O. Box 398
Austin, TX 78767-0398
Phone: (512) 853-8800
Date: 1/21/2005 JCH/MSW